WHAT IS CLAIMED IS:

1. - 19. (canceled)

20. (currently amended) A method ~~for acquisition of shapes from images with representations of HEp-2 cell sections as objects and for learning abstract shape models from representations of HEp-2 cell sections for a case database~~ for a case-based recognition of HEp-2 cells in digital images of HEp-2 cell sections, comprising ~~wherein~~:

acquiring data for each image by manual tracing of edges of an image in the form of visible outer and/or inner contours of HEp-2 cells by means of a hand-held input device connected to a computer, wherein the data ~~are acquired that~~ can be correlated with these edges and the HEp-2 cells as objects represented thereby;

eliminating a ~~the~~ translation of each object ~~is eliminated~~ such that each object is moved into the origin of a coordinate system;

scaling each object in accordance with the correlated data ~~is scaled~~ within the coordinate system;

comparing at least two objects ~~are compared~~ with one another, respectively, wherein the objects are oriented toward one another, wherein for comparing ~~in this connection~~ scaling and/or rotation is carried out;

calculating at the same time[[, the]] a similarity ~~is calculated~~ based on

$$D(P,O) = \sum_{i=1}^{N} \left| \frac{(p_i - \mu_p)}{\delta_p} - R(\Theta) \frac{(o_i - \mu_o)}{\delta_o} \right|^2$$

P, O - objects

Θ - rotation matrix

μ_p and μ_o - center points of the objects P and O

δ_p and δ_o - the sums of the squared spacings of each point from the center points;

during calculation of the similarity, determining ~~the~~ similarity parameters ~~are determined~~ either as distance values or similarity values between the objects, respectively, until either a minimum of the distance values or a maximum of the similarity values is

present;

based on the determined distance values or similarity values, forming sets of similar objects ~~are formed~~ and hierarchically ~~ordered~~ ordering the sets as a dendogram; and

dividing the dendogram by presetting distance values or similarity values ~~is divided~~ into groups and selecting within the groups one prototype ~~is selected~~, respectively, wherein the prototype either is an averaged shape averaged based on individual shapes of the group or the median of the group of the individual shapes.

21. (previously presented) The method according to claim 20, wherein the distance values or the similarity values define a distance matrix or a similarity matrix.

22. (currently amended) The method according to claim 20, representing ~~wherein~~ the distance values or the similarity values ~~are~~ hierarchically ~~represented~~ by means of the single linkage method and a dendogram.

23. (currently amended) The method according to claim 20, comprising: ~~wherein~~

intersecting the dendogram ~~is intersected~~ once on the similarity scale in accordance with either at least one fixed, and thus automatic, or at least one user-specific threshold so that groups result~~, that~~;

correlating the individual forms ~~are correlated~~ with the groups~~, that~~;

in the groups, selecting one prototype ~~is selected~~, respectively, wherein the prototype is either an averaged shape that is averaged based on the individual shapes of the group or the median of the group of the individual shapes~~, that~~;

representing the averaged shape or the median of group ~~is represented~~ on a ~~or the~~ data viewing device[[,]]; and ~~that~~

saving the contour points of the averaged shape or the median ~~is saved~~ as a data set in the computer.

24. (previously presented) The method according to claim 20, wherein

a reduction of the data acquired by tracing the edges and thus of the points as the visible outer and/or inner contours is realized by interpolation with a polynomial.

25. (currently amended) The method according to claim 20, ~~wherein~~ standardizing the data of the objects ~~are standardized~~ such that the center point of the object corresponds to the coordinate origin 0, 0.

26. (canceled)

27. (canceled)

28. (canceled)

29. (currently amended) The method according to claim 20, comprising:

~~wherein by means of an index~~ ordering the cases ~~are ordered~~ in the case database by an index in accordance with the similarity relations such that from a set ~~either~~ of prototypes the most similar prototype or from a set of cases the most similar case can be found quickly for the object in the image.

30. (canceled)

31. (currently amended) [[A]] The method according to claim 20 ~~for acquisition of shapes from images with representations of HEp-2 cell sections as cases and for case-based recognition of HEp-2 cells as objects in digital images~~, wherein

- ~~on the one hand,~~ for acquisition of shapes from images with cases and for learning abstract shape models based on these cases for a case database, for each image with cases:
  - data are acquired by manual tracing of edges of an image in the form of visible outer and/or inner contours with a handheld input device connected to a computer which data can be correlated with these edges and thus cases;
  - at least two cases are compared with one another, respectively, by

means of moving and scaling for each case;

- the two cases are oriented toward one another and in this connection at the same time the similarity is calculated by determination of similarity parameters;
- in accordance with the similarity parameters, sets of similar cases are formed and ordered hierarchically as a dendogram;
- the dendogram, by presetting distance values or similarity values, is divided into groups and within the groups a prototype is selected;

- ~~on the other hand,~~ for recognition of an object in a digital image with objects from the case database a case is selected as a case image with a case description, wherein at the same time:

- an image sequence is generated of the case image as a pyramid with image planes;
- a gradient image of the actual digital image is generated and is transformed into an image sequence as a pyramid with image planes;
- the case image is successively moved onto each object image of the gradient image beginning with the highest image planes, wherein the case image is compared to each object image of the gradient image and ~~in this connection~~ at the same time [[the]] a similarity is calculated by determination of similarity parameters, and the degree of similarity between case image and object image is determined by the similarity parameter.

32. (currently amended) The method according to claim 31, wherein ~~the~~ a translation of each case is eliminated by: ~~such that~~

moving each case ~~is moved~~ into the origin of a coordinate system~~, that~~;

scaling each case in accordance with the correlated data ~~is scaled~~ within the coordinate system~~, that~~;

comparing at least two cases ~~are compared~~ with one another, respectively[[,]];

~~that~~ orienting the cases ~~are oriented~~ toward one another, wherein ~~in this~~

~~connection~~ scaling and/or rotation is performed[[,]];

~~that~~ at the same time calculating the similarity ~~is calculated, that during calculation of the similarity~~ and determining the similarity parameters ~~are determined~~ either as distance values or similarity values between the cases, respectively, until either a minimum of the distance values or a maximum of the similarity values is present~~, that~~;

based on the determined distance values or similarity values, forming sets of similar cases ~~are formed~~ and ~~ordered~~ hierarchically ordering the sets as a dendogram~~, and that~~;

dividing the dendogram by presetting distance values or similarity values ~~is divided~~ into groups and selecting within the groups a prototype ~~is selected~~, respectively, wherein the prototype is either an averaged shape that is averaged based on the individual shapes of the group or the median of the group of the individual shapes.

33. (canceled)

34. (canceled)

35. (canceled)

36. (currently amended) The method according to claim 31, comprising:

~~wherein~~ selecting a case image with a case description ~~is selected~~ from the case database;[[,]]

~~wherein~~ subsequently or simultaneously generating an image sequence ~~is generated~~ from the case image as a pyramid with image planes~~, that~~;

generating a gradient image of the actual digital image ~~is generated~~ and ~~is transformed~~ transforming the gradient image into an image sequence as a pyramid with image planes[[,]];

~~that~~ moving the case image [[is]] successively ~~moved~~ onto each object image of the gradient image beginning with the highest image planes, wherein the case image is compared with each object image of the gradient image, ~~that~~ the case image is oriented toward the object image ~~wherein in this connection~~ and scaling and/or rotation of the case

image is carried out~~, that~~;

at the same time calculating the similarity ~~is calculated, that during the calculation of the similarity~~ and determining the similarity parameters ~~are determined~~ either as distance values or similarity values between the case image and the object image, respectively, until either a minimum of the distance values or a maximum of the similarity values is present[[,]]; and

~~that~~ determining the degree of similarity between case image and object image ~~is determined~~ by the similarity parameter such that the degree of similarity decreases with decreasing similarity parameter and the object image becomes less similar to the case image.

37. (currently amended) The method according to claim 36, ~~wherein~~ comprising:

generating by means of an edge detection of the objects of the digital image the gradient image~~; is generated~~,

~~that~~ correlating gradients ~~are correlated~~ with large changes of the grayscale value in the vertical direction as well as in the horizontal direction, respectively, wherein ~~and~~ no gradient is correlated with homogenous surfaces so that the homogenous surfaces are black.

38. (currently amended) The method according to claim 31, ~~wherein~~ comprising:

forming a gradient image ~~is formed~~ based on the case image as well as the object image, respectively[[,]];

transforming ~~that~~ these gradient images each ~~are transformed~~ into an image sequence as a pyramid with image planes; and

~~that~~ successively comparing the directional vectors in the image planes of the case image and the object image ~~are compared~~ with one another by forming the product.

39. (previously presented) The method according to claim 31, wherein the case image is a prototype of the individual shapes of a group of either averaged shape or

the median of the group of individual cases, wherein groups are sets of similar individual cases ordered as a dendogram with determined distance values or similarity values and the most similar case determines the branch of the dendogram or that the case image is an individual image of a case.

40. (currently amended) The method according to claim 31, comprising: ~~wherein~~

calculating the directional vector between either two points or neighboring points of the edges ~~is calculated~~ for the case image or ~~will be calculated~~ for the object image; ~~and that~~

during the calculation of the similarity, determining the similarity parameters ~~are determined~~ as directional vectors as well as either as distance values or similarity values between the case image and the object image, respectively.

41. (canceled)

42. (canceled)

43. (currently amended) The method according to claim 32, wherein the degree of similarity and thus the identity between case image and object image is determined by the similarity parameter and represents a threshold value, wherein ~~and that~~ a non-identical object relative to the case is either refused or is represented as a case on the data viewing device so that, by ~~means of~~ manual determination and by manual tracing of edges in the form of visible outer and/or inner contours with the hand-held input device connected to the computer, data are acquired that can be correlated with these edges and thus the case and can be correlated with the dendogram with the determined cases.

44. (currently amended) A computer program product with a program code stored on a digital storage medium ~~either~~ for performing the method of claim 20 for a case-based recognition of HEp-2 cells in digital images of HEp-2 cell sections ~~acquisition of~~

~~shapes from images with representations of HEp-2 cell sections as objects and for learning abstract shape models of represented HEp-2 cells as defined in claim 20 or for performing the method for acquisition of shapes from images with cases and for case-based recognition of objects in digital images as defined in claim 31~~, when the program is running on a computer.

45. (currently amended) A computer program product with a machine-readable digital storage medium ~~carrier either~~ for performing the method of claim 20 for a case-based recognition of HEp-2 cells in digital images of HEp-2 cell sections ~~acquisition of shapes from images with representations of HEp-2 cells as objects and for learning abstract shape models of representations of HEp-2 cell sections as defined in claim 20 or for performing the method for acquisition of shapes from images with cases and for case-based recognition of objects in digital images as defined in claim 31~~, when the program is running on a computer.

46. (currently amended) A digital storage medium that can interact with a programmable computer system such that [[a]] the method of claim 20 for a case-based recognition of HEp-2 cells in digital images of HEp-2 cell sections ~~for acquisition of shapes from images with representations of HEp-2 cells as objects and for learning abstract shape models of representations of HEp-2 cell sections as defined in claim 20, or that can interact with a programmable computer system such that a method for acquisition of shapes from images with cases and for case-based recognition of objects in digital images as defined in claim 31~~ is carried out.